

Implementation Of Steam Model To Increase Student Engagement Through Lesson Study

Suharniwati¹, Nuraini², Sapariah³, Amri Zulkarnain^{4*}, Rusdan⁵, M. Alpan Hadi⁶, Khaerudin⁷

¹TK Lisa Nuraini, Lenek Duren, East Lombok, Indonesia

²Universitas Hamzanwadi, Selong, East Lombok, Indonesia

³SDN 4 Jerowaru, Keruak, East Lombok, Indonesia

^{4*}SDN 3 Sikur, Sikur, East Lombok, Indonesia

⁵SDN 1 Sekaroh, Keruak, East Lombok, Indonesia

⁶MA Assawiyah NW, Pringgasela Timur, East Lombok, Indonesia

⁷SD Islam NWDI Tanah Abror, Sakra Timur, East Lombok, Indonesia

*Corresponding Author Email: amrizulkarnain422@gmail.com

Abstract: Lesson Study is conducted to improve students' understanding through collaborative learning approach. The purpose of this study is to apply the STEAM model in improving students' understanding at SDN 4 Jerowaru. This research methodology uses qualitative methods. The techniques used to collect data in this study were adjusted to the type of data taken, namely (1) observation, (2) rubrics, (3) tests, and (4) documentation, taking pictures by researchers to strengthen the data obtained in learning activities. The data analysis technique used in this research is qualitative descriptive technique. The results of this study In cycle I of the learning process activities or at the do stage showed that students still did not look active and their creative thinking skills were still not very significant, so a reflection was carried out by the model teacher to plan the plan process in cycle II, several improvements were made by changing the methods used and learning materials. Furthermore, at the do stage of cycle II, student activities have looked very active, collaboration between groups has been active, besides that students' creative thinking skills have increased significantly.

Article History

Received: 30-01-2024

Revised: 23-02-2024

Published: 30-03-2024

Key Words :

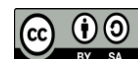
Lesson Study, STEAM Model, Natural Resources, Eco-enzymes

How to Cite: Suharniwati, S., Nuraini, N., Sapariah, S., Zulkarnain, A., Rusdan, R., Hadi, M. A., & Khaerudin, K. (2024). Implementation Of Steam Model To Increase Student Engagement Through Lesson Study. *IJE : Interdisciplinary Journal of Education*, 2(1), 37–46. <https://doi.org/10.61277/ije.v2i1.78>



<https://doi.org/10.61277/ije.v2i1.78>

This is an open-access article under the [CC-BY-SA License](https://creativecommons.org/licenses/by-sa/4.0/).



Introduction

Education is one of the important pillars in the development of a quality society. Improving the quality of learning is crucial in achieving this goal. However, in the midst of the dynamics of curriculum development and the increasingly diverse needs of students, the challenge for educators to deliver material in an effective and student-oriented way is a necessity.

In this context, the background of this lesson study is influenced by several factors. First, the results of the internal evaluation showed a mismatch between the teaching methods

used and the learning characteristics of students. Second, the changes in the national curriculum demanded an adjustment to a more contextualized learning approach. Third, students' active participation in learning becomes the main focus to achieve skill-based learning and concept understanding.

The need for a new orientation in education feels so strong and real in various aspects and fields of study, both exact and social sciences. Educators and educational practitioners must be able to respond to the changes that occur by changing the educational paradigm. One way to answer and overcome the changes that occur continuously is by implementing various innovative learning models, which are expected to be able to boost the quality of the learning process.

Lesson study is real learning in the classroom with students observed by other teachers as observers and reflection activities are carried out after the learning process is complete (Sriyati, 2005). Lesson study activities, which basically include three parts of activities, namely planning, implementation and reflection, can not only show an interesting and quality learning process because it can activate and intensify student involvement in the teaching and learning process, student relationships with learning objects, but also expected to help evaluate learning outcomes and utilize feedback.

Lesson Study is not a strategy or method in learning, but one of the coaching efforts to improve the learning process conducted by a group of teachers collaboratively and continuously in planning, implementing, observing and reporting learning outcomes.

Lesson Study is not a one-time project, but a continuous activity and an effort to apply the principles of Total Quality Management, which is to improve the process and results of student learning continuously based on data. Lesson study is one of the efforts to prepare prospective teachers' skills through a process of training or learning. Many positive things in the form of functional relationships, influence, and development are obtained as a result of the application of lesson study in Biology learning. Lesson study as a model used for teaching guidance for students, because in the model developed collaborative work, collegial and mutual learning (mutual learning) (Rahmawati, 2014; Mulyana, 2007).

Lesson Study is conducted to improve students' understanding through a collaborative learning approach. This theoretical fact shows that lesson study can be used to organize, train and guide students in learning activities. For this reason, lesson study implementation using the inquiry model was conducted in an effort to improve teaching skills and learning quality.

Research Method

The research method used is qualitative method, which consists of lecture, observation, question and answer, and demonstration. This lesson study was conducted in two meetings divided into cycle I and cycle II in class IV with the material of natural resource conservation efforts "Making Eco-enzymes from organic waste / orange peel". The material selection is adjusted to the ongoing learning schedule at school. Then in cycle II also still using teaching materials with the same theme, the model applied in Natural Resources Conservation Efforts "Making eco-enzymes is a STEAM learning model.

The lesson study implementation time was carried out in semester 2, for cycle I on Monday 15 January 2024, while for cycle II on Wednesday 17 January 2024.

Lesson study was conducted in two meetings divided into cycle I and cycle II in class IV with the material of natural resource conservation efforts "Making Eco-enzymes from

organic waste / orange peel". The material selection was adjusted to the ongoing learning schedule at school. Then in cycle II also still using teaching materials with the same theme, the model applied in Natural Resources Conservation Efforts "Making eco-enzymes is a STEAM learning model.

Result and Discussion

It involves collaboration between students in planning, teaching and evaluating lessons together. Lesson study at SD Negeri 4 Jerowaru has the scope and objectives of activities that focus on improving the quality of teaching and learning. The following are some aspects of the scope and objectives of lesson study activities at SD Negeri 4 Jerowaru.

Lesson Study Implementation

Implementation of Cycle I

The activities in cycle I began with the "Plan" stage, which is the activity of preparing a learning design using the previously agreed learning model. The next stage of the "Do" (implementation) stage is the application of the STEAM learning model using the lesson study method. This activity is carried out during one face-to-face meeting or 2 lesson hours. The implementation of this learning is carried out by one model teacher who is tasked with teaching or being a learning facilitator and 4 observers who are tasked with observing the learning process. The last stage is the "See" (reflection) stage, which is the stage of reflecting on the learning outcomes.

a. Plan.

Designing learning with the STEAM model to improve students' creative thinking skills. Needs Analysis and Division of Main Tasks, Planning begins with activities to analyze the needs and problems faced in learning, then together also look for solutions to solve the problems found. The conclusion of the analysis of needs and problems that become part to be considered in the preparation of teaching modules and the implementation of lesson study. After analyzing the needs, it is determined what main tasks must be made and divided to each member. The division of tasks is adjusted to the planning of place, time, material topics, teaching modules, preparation of model teachers in teaching, and observers. The division includes: Sapariah: Model Teacher, Amri Zulkarnaen: Observer, Rusdan: M. Alpan Hadi: Observer Khaerudin: Observer, and Suharniwati: Documentary.

Determining the Place and Time of Implementation, Lesson study was conducted at SD Negeri 4 Jerowaru class VI with the material "Efforts to Preserve Natural Resources. The material selection was adjusted to the ongoing learning schedule at school. The methods used were lecture, question and answer, demonstration, and practice. The learning model applied is STEAM on the material of Natural Resources Conservation and Submaterial of Making Ecoenzymes.

Determining the Material Topic, the material in this lesson study activity is "Efforts to Preserve Natural Resources". The material selection is adjusted to the ongoing learning schedule at school. The methods used include lectures, questions and answers, demonstrations, and experiments. The learning model applied is STEAM on the Making of Ecoenzymes as an Effort to Preserve Natural Resources.

One of the important parts in the preparation of this lesson study is lesson planning and all the tools that must be present in the learning that will take place, therefore the Teaching Module or RPP is prepared as a learning tool that is adjusted to the syllabus that already exists in the independent curriculum. The following plan activities are carried out as shown below.



Figure 1. Activity Plan

b. Do (Implementation)

At this stage, the Lesson Study implementation aims to implement the lesson design. In the implementation process, one teacher acts as an implementer and another teacher as an observer. The focus of the observation is not on the teacher's teaching performance, but rather on the students' learning activities guided by the procedures and instruments that have been agreed upon at the planning stage. Observers are not allowed to interfere with the learning process.

Based on the lesson plan that has been prepared, the model teacher carries out the learning in the predetermined class, while other members act as observers, who observe the learning process using the research instruments that have been developed. Thus, along with the implementation of the learning process, data collection is needed for reflection purposes. The lesson study was conducted in class IV of SD Negeri 4 Jerowaru in Jerowaru village, Jerowaru sub-district on Monday, January 8, 2024 at 08.30-09.50 WITA. Activities were carried out in groups according to the division of main tasks that had been determined previously at the Plan stage. Sapariah was the model teacher, while Amri Zulkarnaen, Rusdan, M. Alfani Hadi, Khaerudin, Suharniwati.

The results of the analysis of the characteristics of fourth grade students of SD Negeri 4 Jerowaru have high curiosity, active, and enthusiastic in asking questions and providing answers related to the material.

Based on the results of the analysis, the appropriate learning model in the implementation of lesson study is using STEAM model. This is because students still need guidance in the implementation of learning.

Observers consisting of 5 students who observe the interaction between students, students with teachers, and students with others using observation instruments in observation sheets that have been prepared previously and compiled together.

The observer is not only an assessor or evaluator of the model teacher, but the observer must also be able to learn from the learning that takes place. In the process of this lesson study activity, from the beginning to the end, video and photo recording are used for documentation and further analysis.

Recording and taking photos did not interfere with the learning process. Observers took notes on student learning behavior during the lesson, for example on student comments or discussions and tried to include the names of the students concerned, the construction process of student understanding through student learning activities.



Figure 2. Cycle I Do Learning Stages Activities

c. See (Reflection)

The see stage or reflection of learning was conducted directly after completing the do stage, which was on January 8, 2024. At the see stage, the lesson study implementation team discussed all the activities that had been carried out at the do stage. Based on the observations made by the observer, the do stage that has been implemented has the following results. First, Cognitive (Knowledge) The students' knowledge was able to achieve the learning indicators, namely being able to explain efforts to conserve natural resources and being able to create ecoenzymes from organic materials. Second, Affective (Attitude) The attitude assessment that was observed was cooperation and responsibility. Indicators of carrying out experiments to make ecoenzymes from orange peels in accordance with the work instructions in the LKPD. All group members compactly complete the measurements and pour them into the Learner Worksheet that has been provided. After that in groups students should present it in front of the class but students still do not seem to have the confidence to present their work. Based on the observers' observations, in this first cycle, there were still some children who were not actively cooperating in completing their experiments. Likewise, when they listen to the explanation of the material from the teacher, there are still those who like to talk. In addition, it was also seen that no one dared to ask questions.

Third, Psychomotor (Skills) Student skills in group work are observed in accordance with the indicators. Students have not mastered the indicator of presenting experimental

results. For this reason, students need to be given another explanation of the steps in the presentation of group assignments. Observer Comments, Observer comments on learning using the STEAM model are contained in the observation sheet of each observer attached to this lesson study report.



Figure 3. See Cycle I Reflection

Implementation of Cycle II

The implementation of cycle II was more focused on improving students' ability to communicate the results of their group work in the material of efforts to conserve natural resources by making coenzymes using orange peels. In this learning activity students are emphasized to be able to communicate the results of their experiments both in writing through LKPD and orally.

Cycle II was carried out during one face-to-face meeting and was carried out by one model teacher who was assigned to teach and become a facilitator during the learning process.

a. Plan

The purpose of Lesson Study is to design learning with STEAM model to improve students' creative thinking skills. Analysis of the reflection results of learning activities in cycle I became a reference for planning in cycle II. The observer's findings are then used as the main basis in determining the learning plan contained in the teaching module that will be used by the model teacher in carrying out learning activities.

The division of tasks in this cycle was carried out in accordance with the division of tasks in cycle I. Lesson study was conducted at SD Negeri 4 Jerowaru class IV with the same material, namely Efforts to Preserve Natural Resources by making Ecoenzymes but with continued activities from cycle I.

Determining the Material Topic, the material in this lesson study activity is "Efforts to Preserve Natural Resources by making Ecoenzymes". The material selection is adjusted to the ongoing learning schedule at school. The methods used include lectures, questions and answers, demonstrations, and experiments. The learning model applied is STEAM.

Preparation of Teaching Modules in accordance with the Learning Outcomes in the Independent Curriculum, One of the important parts in preparing for this lesson study is lesson planning and all the tools that must be present in the learning that will take place,

therefore the Teaching Module / lesson plan is prepared as a learning tool that is adjusted to the syllabus that already exists in the independent curriculum, in this case the process of improving the lesson plan is carried out referring to the learning results in cycle 1.



Figure 4. Cycle II Plan

b. Do (Implementation)

At this stage, the lesson study aims to implement the lesson design. In the implementation process, one teacher acts as the implementer and another teacher as the observer. The focus of observation is not on the performance of the teacher who teaches, but rather directed at student learning activities guided by procedures and instruments that have been agreed upon at the planning stage. Observers are not allowed to interfere with the learning process.

Based on the lesson plan that has been prepared, the model teacher carries out the learning in the predetermined class, while other members act as observers, who observe the learning process using the research instruments that have been developed. Thus, along with the implementation of the learning process, data collection is needed for reflection purposes.

The lesson study was conducted in class IV of SD Negeri 4 Jerowaru in Jerowaru District on Wednesday, January 17, 2024 at 08.30-09.50 WITA. Activities were carried out in groups according to the division of main tasks previously determined at the Plan stage, namely Sapariah: Model Teacher, Amri Zulkarnaen: Observer, Rusdan: M.Alpan Hadi: Khaerudin Observer: Observer, and Suharniwati: Documentary.

The results of the analysis of the characteristics of fourth grade students of SD Negeri 4 Jerowaru have high curiosity, active. After being given an explanation of how to ask questions and convey or communicate the results of activities, they become more confident and dare to ask questions and are able to present their work with their language. In this activity, students seemed more compact in group work to complete the LKPD and seemed confident in presenting it in front of the class.

Observers consisting of 4 students who made observations of interactions between students, students with teachers, and students with others by using observation instruments in observation sheets that had been prepared previously and compiled together.

Observers are not only observers of student and teacher activities, but observers must also be able to learn from the learning that takes place. In the process of this lesson study activity, from the beginning to the end, video and photo recording were used for documentation and further analysis.



Figure 5. Cycle II Do Learning Stages Activities

c. See (Reflection)

The see stage or reflection of learning was conducted directly after the do stage was completed, on January 17, 2024. At the see stage, the lesson study implementation team discussed all the activities that had been carried out at the do stage. Based on the observations made by the observer, the do stage that has been implemented has the following results. First, Cognitive (Knowledge), Students' knowledge is able to achieve learning indicators, namely being able to identify existing natural resources and how to preserve them, and being able to make ecoenzymes from organic materials. In cycle 2, there was an increase in students' creative thinking skills. Second, Affective (Attitude) The attitude assessment that was observed was cooperation, responsibility, and confidence. Based on the observers' observations, there was an increase in positive attitudes shown by students during learning. Third, Psychomotor (Skills) Student skills in group work are observed in accordance with the indicators. Students have been able to master the indicators in presenting the task appropriately and well. Fourth, Observer Comments on learning using the STEAM model are attached to this lesson study report.



Figure 6: Cycle II Reflection See

In cycle I, the activities of the learning process or at the do stage showed that students still did not look active and their creative thinking skills were still not very significant, so a reflection was carried out by the model teacher to plan the plan process in cycle II, several improvements were made by changing the methods used and learning materials. Furthermore, at the do stage of cycle II, student activities have looked very active, collaboration between groups has been active, besides that, students' creative thinking skills have increased significantly, this can be seen from the results of observations by observers. In line with the results of research conducted by, N Nur and MS Nugraha (2023) the implementation of the STEAM learning model in improving student creativity can improve students' creative thinking skills and learning outcomes. Not only that, other findings were carried out by, DD Dermawan and K Andartiani (2022) Electronic Development of STEAM Based worksheets to Improve Students' Thinking Ability.

Conclusion

Based on the explanation above, the following conclusions are obtained: Lesson study includes plan, do, and see activities. The first activity of lesson study is plan regarding the determination of objectives, analysis of basic competencies, syllabus, determining the location and adequate time, selection of appropriate learning methods and models for the material that has been determined, and preparation of lesson plans. The second activity of lesson study is do (implementation) regarding learning strategies applied to students based on the analysis of student characteristics and experiences as well as the achievement of learning indicators on food nutrition material. The third activity of lesson study is see (reflection) on the cognitive aspect of grade IV students have understood the learning assessment indicators.

References

- Depdiknas. (2009). *Program Perluasan Lesson Study Untuk Penguatan LPTK*. Jakarta: Direktorat Ketenagaan.
- Slamet Riyadi (Darmodjo, 1991/1992). *Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Sumber Daya Alam*. Jakarta: Ghalia Indonesia.

- Ismail, S. (2014). Membentuk Penguasaan Keterampilan Dasar Mengajar Mahasiswa Program Studi Pendidikan Matematika Peserta PPL-1 dalam Bimbingan Latihan Mengajar Melalui Lesson Study. *Artikel*. Universitas Negeri Gorontalo.
- Winarsih, A., Nugroho, A., Sulityoso, H. P., Amd, M. Z., Pd, S. S., & Suyanto, S. (2008). Ipa Terpadu. *Jakarta: Departemen Pendidikan Nasional*.
- Lewis, C. (2002). Does Lesson study Have a Future in the United States?. *Nagoya Journal of Education and Human Development*. No. 1:1-23.
- Lewis, C. 2003. The Essential Elements of Lesson Study. *Northwest Teacher*. Spring. Vol. 4 No. 3: 6-8.
- Liliasari. (2009). Lesson Study Berbasis ICT. (Online). Tersedia pada http://dl.comlabs.itb.ac.id/wiki/index.php/Lesson_Study_Berbasis_ICT. (23 November 2018).
- Mulyana, S. (2007). Lesson Study. *Makalah*. Kuningan: LPMP-Jawa Barat.
- Ningsih, S. C. (2013). Implementasi Lesson Study Dalam Upaya Meningkatkan Motivasi dan Hasil Belajar Mahasiswa. *Prosiding*.
- Rahmawati, D. (2014). Peningkatan Kompetensi Profesional Calon Guru Melalui Lesson Study. *Aksioma 1(3) : 28-33*.
- Rustono, W. S. (2008). Meningkatkan Kemampuan Mahasiswa Menerapkan Strategi Pembelajaran Melalui Lesson Study di Sekolah Dasar. *Jurnal Pendidikan Dasar 8(2): 21-32*.
- Sriyati, S. (2005). Reformasi Sekolah melalui Lesson Study. *Seminar Nasional Pendidikan IPA II*. FPMIPA UPI Bandung.
- Sudrajat. (2004). *Kurikulum Berbasis Kompetensi (KBK)*. Bandung: CV. Cipta Cemas Grafika.
- Waluyo, D. A. 2009. Ubah Perilaku Menuju Ranah "Lesson Study". (Online). <http://kafeguru.blogspot.com/2009/03/ubah-perilaku-menuju-ranah-lessonstudy.html>. (2 November 2018).